

In the Specification

Please replace the paragraph found on page 10, lines 4-11 of the specification with the following paragraph:

~~Figures 12A and 12B show~~ Figure 12 shows SAD patterns derived from mineralized collagen samples. ~~Figure 12A~~ The left panel of Figure 12 is the diffraction pattern from HA PILP mineralized collagen of the present invention. ~~Figure 12B~~ The right panel of Figure 12 is a SAD diffraction pattern from a 50 year old male femur (after Ziv, V., *et al.*, *Microscopy Research and Technique*, 1996, 33(2):203-213). Note how the patterns are identical, from the arcing of the (002) and (004) planes, which are aligned along the long axis of the collagen fibril, to the (112) diffraction ring just past the (002) diffraction spot. Note- a diffraction pattern containing arcs indicates slight mis-alignment of crystal planes, as compared to a spot pattern that is seen for single-crystalline materials.

Please replace the paragraph found on page 10, lines 12-24 of the specification with the following paragraph:

Figures 13A-13C show electron micrographs of mineralized collagen fibrils. Figure 13A shows an SEM of the mineralized collagen fibril imaged in ~~Figure 12A~~ the left panel of Figure 12. Note the non-descript surface features of the collagen fibril. There appear to be no platy crystals on the surface, suggesting that the crystals illuminated by the PMDF TEM image in Figure 11C are within the fiber (i.e. the collagen fibril is intrafibrillarly mineralized). Bar = 100 nm. Figure 13B shows Energy Dispersive Spectroscopic analysis of a point in the middle of the fibril in A. Note that the spectrum has been increased to highlight the Ca, P and O peaks which were drowned out by the large peaks from the Al SEM stub and the Cu TEM grid. The large C peak is an artifact of the amorphous carbon coating process used to prevent charging in SEM. Figure 13C shows a Bright Field TEM image of a mineralized collagen fibril. Platy crystals can be seen along the long axis of the collagen fibril. Note the 64 nm banding pattern of type-I collagen fibril that appears perpendicular to the long axis of the collagen fibril (highlighted by the arrow). Bar = 100 nm.

Please replace the paragraph found on page 34, lines 12-24 of the specification with the following paragraph:

While this diffraction pattern itself is intriguing data, what makes it most impressive is that it is identical, from the (21.1) diffraction ring to the arcing of the (002) and (004) diffraction planes, to mineralized collagen in bone. ~~Figures 12A and 12B show~~ Figure 12 shows a side-by-side comparison of diffraction data from the mineralized collagen fibril of the present invention to that of natural bone. It is important to note that while researchers have observed collagen to diffract x-rays due to its anisotropic orientation (yielding arc patterns typical of oriented fibrous materials), the small scale of isolated collagen fibers that is used for electron diffraction is not sufficient to diffract electrons, as is seen in Figure 9B of an SAD pattern of collagen fibers prior to mineralization. Therefore, it can be concluded that the diffraction pattern in Figure 11B could not be from the collagen by itself. As mentioned, the HA mineral phase is not easily observed within the collagen fibril. This was easily overcome using Poor Man's darkfield (PMDF), a technique that uses only the electrons diffracted from selected planes to image a sample.